# **Pipe**

### **Pipe Overview**

Volunteer monitoring began at Pipe Lake in the 1980s and has been continuous since 1993. The data indicate this city lake (Maple Valley-Covington) is low to moderate in primary productivity (oligotrophic - mesotrophic) with very good water quality.

Pipe Lake has no public access boat launch, but has a history of both milfoil and hydrilla infestations for which eradication efforts have been funded by government agencies since 1995. Residents should watch aquatic plants growing nearshore to catch growing patches of these and other noxious weeds.

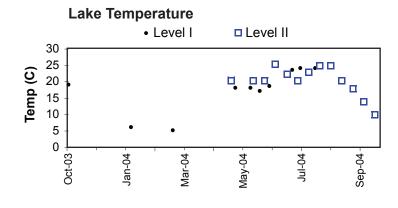
### **Physical Parameters**

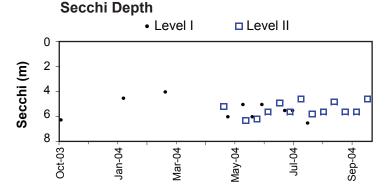
Secchi transparency from late April through October ranged from 4.6 to 6.3m, averaging 5.5 m which placed it among the small lakes with the highest transparency in 2004. Water temperatures for the same period reached 25.0 degrees Celsius, which was in the lower mid range for maximum temperatures recorded among the group.

Local precipitation was measured through the year, but was not accompanied by water level observations.

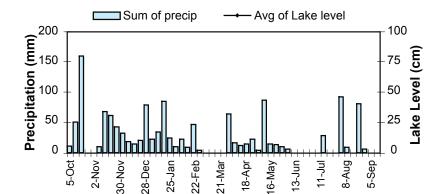
## **Nutrient Analysis and TSI** Ratings

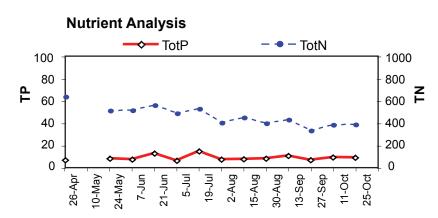
Total phosphorus and total nitrogen remained in fairly constant proportion to each other through the sampling period, with nitrogen declining slightly through the season. The N:P ratio ranged from 35 to 87, averaging 53 which suggested generally poor conditions for nuisance bluegreen growth.





Lake Level and Precipitation





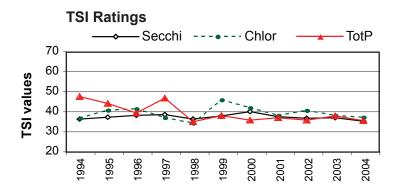
Profile data indicate that thermal stratification was present early in the season. There was no build up of phosphorus in the deep water. Chlorophyll data indicated that algae were equally distributed through the shallow depths of the water column.

The 2004 TSI values were very close to each other at the high end of the oligotrophic range, similar to 2001 and 2003.

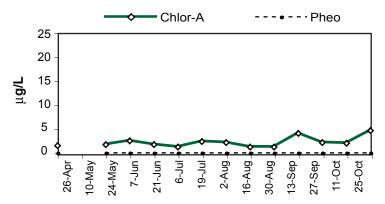
## **Chlorophyll Concentrations** and Algae

Chlorophyll was very low through the sample season, with a small increase in the fall. The most common species included the diatoms Fragilaria crotonensis and Asterionella formosa, the colonial bluegreens Anacystis and Snowella, and several species of cryptophytes.

Date S	depth-m	degC	Chlor-A	TP µg/L	TN µg/L
5/24/04 6.3	1	20.0	1.80	8.7	521
	9	11.0	1.90	11.5	666
	18	6.5		16.5	715
8/30/04 5.6	1	24.5	1.30	8.6	406
	9.5		1.80	11.2	714
	17			7.5	606



### Chlorophyll a Concentrations (ug/L)



Common Algae	Group			
Asterionella formosa	Bacillariophyta			
Anacystis sp	Cyanobacteria			
Cryptomonas sp	Cryptophyta			

# **Pipe**

# 2004 Level I Data

Daily Dat	Sum of										
\A\   6	precip.	# of	Avg of lake	# of		Sample	Secchi	Temp	Algae*	Algae*	Goose
Week of	(mm)	days	level (cm)	days	Sample date	time	(m)	(°C)	(Shore)	(at site)	Count
28-Sep-03	0.0	4			3-Oct-03	11.20	6.2	10.0	NA	C1	
5-Oct-03	11.0	7				11:30	6.3	19.0	NA P1	C1 P1	0
12-Oct-03	50.0	7			21-Dec-03	11:30	4.5	6.0	PI	PT	0
19-Oct-03	158.0	7									
26-Oct-03	0.0	7						-			-
2-Nov-03	0.0										
9-Nov-03	10.0	7									
16-Nov-03 23-Nov-03	67.0	7 7									
30-Nov-03	61.0										
	42.0 32.0	7			H				_		-
7-Dec-03 14-Dec-03	18.0	7									
21-Dec-03	14.0 20.0	4 2									
28-Dec-03 4-Jan-04		2									
	78.0	6			H				_		
11-Jan-04	22.0										
18-Jan-04 25-Jan-04	34.0 84.0	1 7									
25-Jan-04 1-Feb-04	24.0	7									
8-Feb-04	10.0	7	-		12-Feb-04	1:00	4.0	5.0	C1	C1	0
15-Feb-04	9.0	7			12-Feb-04	1:00	4.0	5.0	Ci	C1	0
22-Feb-04 29-Feb-04											
	46.0	7									
7-Mar-04	4.0 0.0	7									
14-Mar-04		5 0	-		H			-			-
21-Mar-04	0.0										
28-Mar-04	0.0	0									
4-Apr-04		7									
11-Apr-04	63.0 16.0	7									
18-Apr-04	12.0	7							-		-
25-Apr-04 2-May-04	14.0	1			1-May-04	15:00	6.0	18.0	P1	P1	0
-	22.0	3			1-iviay-04	15.00	0.0	16.0		FI	"
9-May-04 16-May-04	4.0	7			20-May-04	10:00	5.0	18.0	P1	P1	0
23-May-04	86.0	7			20-iviay-04	10.00	3.0	10.0		F I	"
30-May-04	14.0	7			1-Jun-04	10:00	6.0	17.0	P1	P1	4
6-Jun-04	13.0	7			1-5411-04	10.00	0.0	17.0		• •	7
13-Jun-04	10.0	2			13-Jun-04	14:00	5.0	18.5	P1	P1	0
20-Jun-04	6.0	1			10 0411 0-1	14.00	0.0	10.0		• •	
27-Jun-04	0.0	7									
4-Jul-04	0.0	7									
11-Jul-04	0.0	7			12-Jul-04	11:00	5.5	23.5	P1	P1	0
18-Jul-04	0.0	7			22-Jul-04	8:00	5.5	24.0	P1	P1	0
25-Jul-04	0.0	7				0.00	0.0				
1-Aug-04	28.0	7									
8-Aug-04	0.0	7			10-Aug-04	10:00	6.5	24.0	P1	P1	0
15-Aug-04	0.0	7				. 5.00	0.0				
22-Aug-04	91.0	7									
29-Aug-04	9.0	7									
5-Sep-04	0.0	6									
12-Sep-04	80.0	4			H						
12-Sep-04 19-Sep-04	6.0	7									
26-Sep-04	0.0	5									
Min	0.0			0.0	H	Min	4.0	5.0			
Max	158.0			0.0		Max	6.5	24.0			
Total	1290.0			٥.٠			0.0				
	1200.0										

<sup>\*</sup> See introduction for discussion of algae assessment and goose count methods.

# 2004 Level II Data

	Secchi Chl-a			Algae		Calculated TSI				
Date (2004)	Temp (°C)	(m)	<b>(μg/l)</b>	TP (μg/l)	<b>TN (μg/l)</b>	Obsv.	N:P	Secc	chl-a	TP
26-Apr	20.0	5.2	1.60	7.4	646	1	87	36.2	35.2	33.0
10-May										
24-May	20.0	6.3	1.80	8.7	521	1	60	33.4	36.3	35.4
•										
7-Jun	20.0	6.2	2.56	7.8	522		67	33.7	39.8	33.8
21-Jun	25.0	5.6	1.80	13.2	568	2	43	35.1	36.3	41.4
• • • • • • • • • • • • • • • • • • •	20.0	0.0				_		55		
6-Jul	22.0	4.9	1.30	6.8	496	1	73	37.1	33.1	31.8
19-Jul	20.0	5.6	2.40	15.2	537	1	35	35.1	39.2	43.4
19-Jul	20.0	5.0	2.40	13.2	557	ı	33	35.1	39.2	43.4
2-Aug	22.5	4.6	2.24	7.9	413	1	52	38.0	38.5	34.0
40.4	0.4.5	- 0	4.00		450	•			00.4	
16-Aug	24.5	5.8	1.30	8.0	459	0	57	34.6	33.1	34.1
30-Aug	24.5	5.6	1.30	8.6	406		47	35.1	33.1	35.2
13-Sep	20.0	4.8	4.17	11.2	438	2	39	37.4	44.6	39.0
27-Sep	17.5	5.6	2.24	7.4	342	1	46	35.1	38.5	33.0
·										
11-Oct	13.5	5.6	2.08	9.7	392	1	40	35.1	37.8	36.9
25-Oct	9.5	4.6	4.71	9.5	395	1	42	38.0	45.8	36.6
20 000	0.0	1.0	1.7 1	0.0	000	•	12	00.0	10.0	00.0
		Secchi	Chl-a					Calculated TSI		
	Temp (°C)	(m)	<b>(μg/l)</b>	TP (μg/l)	<b>TN (μg/l)</b>	Algae	N:P	Secc	chl-a	TP
Mean	19.9	5.4	2.3	9.3	471.9	1.1	53	35.7	37.8	36.0
Median	20.0	5.6	2.1	8.6	459.0	1	47	35.1	37.8	35.2
Min	9.5	4.6	1.3	6.8	342.0	0	35	33.4	33.1	31.8
Max	25.0	6.3	4.7	15.2	646.0	2	87	38.0	45.8	43.4
Count	13	13	13	13	13	11	13	13	13	13

TSI Average = 36.5